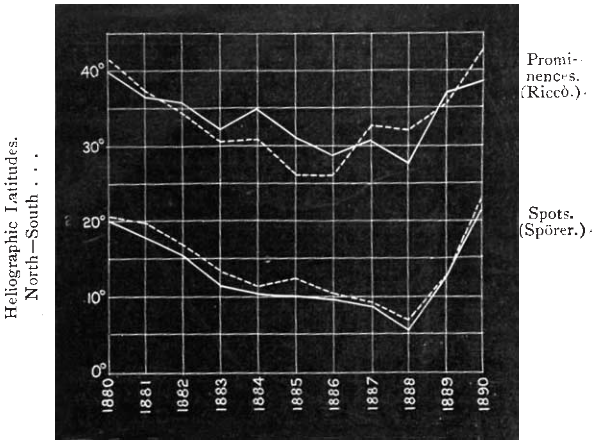
A profitable industry, little heard of, is carried on among the hills of Connecticut (*Sci. Am.*). It is the manufacture of birch oil, which is used largely for confectionery, and gives a perfect wintergreen flavour. There are eight mills in the State—the first built only ten years ago. Birch brush, without foliage, and not over $2\frac{1}{2}$ inches in diameter, from the black, mountain or sugar birch (not the yellow or white), is chopped up and boiled with water in tanks. The steam, passing through an iron pipe near the top, is condensed in a coil immersed in running water, and drops into a glass jar. The oil is much heavier than water, and in the crude state is of copper hue. The mills work only from October to April. A good deal of adulterated birch oil is used in tanning leather to imitate Russia leather.

We have just received the Report for 1890 of the Botanical Exchange Club of the British Isles. There are about fifty members, and a list of the plants that are wanted is sent out every spring. The Secretary is Mr. Charles Bailey, Ashfield College Road, Whalley Range, Manchester. The distributor for last year was the Rev. E. T. Linton, one of our most painstaking British botanists, and the Report is edited by him. The number of specimens received was 4100, from twenty-six contributors. The most interesting novelty of the year is an Arenaria found at the head of Ribblesdale, in Yorkshire, which is nearly allied to, but not quite identical with, *A. norvegica*, known only within the British area in the Shetland Islands and Orkney, and *A. ciliata*, known only in County Sligo. Mr. Linton treats it as *A. gothica*, Fries., but that plant is an annual, whilst the Ribblesdale plant is a perennial. It is, in fact, a form about half-way between *norvegica* and *gothica*. Out of thirty-eight pages of the Report, eleven are occupied by Rubi. A new general working up of the British Rubi is much wanted, and it is evident the different referees to whom the specimens have been sent do not use some of the names with the same application or range of significance. What beginners want are good typical specimens of the most distinct forms. To give them the intermediate connecting links before they know thoroughly the typical sub-species only bewilders them. In roses the difficulty is that it is often impossible to determine a given plant positively without seeing it in three stages—flower, young fruit, and mature fruit—and nearly all the specimens sent to the Club arrive in a single stage. The above remark applies to *R. mollis* and *tomentosa*, concerning which there are eleven paragraphs in the Report, none of which tend to any real enlightenment. To Hieracia the same remark applies as to Rubi; but Mr. F. A. Hanbury's elaborate monograph, now fairly started off, will put this right. Three other sets of plants are at present receiving much attention from the members, *i.e.* hybrid willows, hybrid Epilobia, and Potamogetons. At the end of the Report there is a long list of new county records.

The additions to the Zoological Society's Gardens during the past week include a Brown Capuchin (*Cebus fatuellus* ♀) from Guiana, presented by Miss Phyllis Duncan; a Red-bellied Squirrel (*Sciurus variegatus*) from Trinidad, a Golden Agouti (*Dasyprocta aguti*) from Guiana, a West Indian Agouti (*Dasyprocta cristata*) from the West Indies, two Violet Tanagers (*Euphonia violacea*) from Brazil, presented by Mr. R. J. L. Guppy, C.M.Z.S.; a Common Otter (*Lutra vulgaris*), British, presented by Mr. D. E. Cardinall; a Marbled Polecat (*Putorius sarmaticus*) from Quettah, presented by Colonel C. Shepherd; a Vulpine Squirrel (*Sciurus vulpinus*) from North America, presented by Miss Pickford; seven Lemmings (*Myodes lemmus*) from Norway, presented by Mr. T. T. Somerville; two Sparrow-Hawks (*Accipiter nisus*), British, presented by Mr. Digby F. W. Nicholl, F.Z.S.; a Grey Parrot (*Psittacus erithacus*) from West Africa, presented by Mrs. Hale; a Golden Eagle (*Aquila chrysaëtus*), European, presented by Captain Taylor; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, a Dwarf Chameleon (*Chamæleon pumilus*) from South Africa, presented by Captain Wood; two Common Chameleons (*Chamæleon vulgaris*) from North Africa, presented by Mr. E. Palmer; an Egyptian Ichneumon (*Herpestes ichneumon*) from Spain, a Black-headed Caique (*Caica melanocephala*) from Demerara, deposited; a Yak (*Poëphagus grunniens*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

Periodic Variations in the Latitude of Solar Prominences.—From a paper by Prof. Riccò, in *Comptes rendus* for August 3, it appears that the mean latitude of solar prominences varies periodically in the same way as that of spots. During the last eleven years observations of the form, position, and dimension of solar prominences have been made at Palermo on 2207 days, with the same refractor and spectroscope. In this period 7663 prominences have been observed, having a height equal to or greater than 30″. Neglecting a few irregularities, the observations show that about the time of maximum solar activity prominences occur nearest the sun's equator; the mean latitude for both hemispheres in the second year after the last maximum being 27°·5. There is then a rapid general increase in the latitude of most frequent occurrence up to the minimum epoch, the mean latitude for both hemispheres in the year following the last minimum—that is, in 1890—being 41°·3. In other words, up to the commencement of the minimum period prominences approach the equator. They then appear in high latitudes, to descend again to the equator in an eleven-year cycle. The intimate relation that exists between this variation and that observed in the distribution of spots is evident from an inspection of the accompanying figure, which represents the mean latitudes of spots according to Prof. Spörer's observations, and those found for prominences by Prof. Riccò. The pairs of like curves run almost parallel to each other, and are separated by an approximately equal number of degrees at all points. It is worthy of remark that the photographs of the solar corona recently investigated by Prof. Bigelow exhibit a movement in latitude which is most probably connected with the latitude variations of sun-spots and prominences.



Photography of Solar Prominences and their Spectra.—In the *American Journal of Science* for August, and *Astronomische Nachrichten*, No. 3053, Prof. G. H. Hale gives some results which he has obtained in solar prominence photography, utilizing the methods noted in Nature, vol. xliii. p. 133. With the fourth-order spectrum of a grating having 14,438 lines to the inch, and both radial and tangential slits, the broad H and K lines invariably have bright lines running through them, apparently to the top of every prominence. This is an important fact, for the position of H and K in the spectrum makes it unnecessary to stain the photographic plates, or prolong the exposure, as would be the case if the C line were employed; and their characteristic banded appearance renders them pecu-

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liarly useful as backgrounds for the bright prominence lines, and allows the use of a wide slit. Working with a tangential slit, Prof. Hale has obtained excellent photographs of reversals of H and K. The former line is found to be double, the companion being about 1·5 tenth-metres less refrangible, and possibly coincident with a line of hydrogen at λ 3970·25. The photographs also show three bright lines, which appear to be coincident with the lines α, β, and γ of the hydrogen series. The first of these is seen as a double line, the components of which are separated by a fraction of a tenth-metre.

It is highly probable that a large number of prominences cannot be made out by the ordinary method of observing the C line. These invisible or "white" prominences must therefore be detected photographically. But as it would be an extremely troublesome process to take a set of photographs with the slit tangential to various points on the limb, and as prominences having a considerable elevation could not be easily photographed by this method, another arrangement has been devised which nullifies these objections, and allows eye observations of C to be made while the exposure to the H and K region is going on. Certainly, if Prof. Hale should be able to do for invisible prominences what has been done at Palermo for those visually observable, our knowledge of the relation between the two classes of phenomena and their connection with sun-spots would be considerably extended.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

The following is the list of candidates successful in the competition for the Whitworth Scholarships and Exhibitions, 1891:—(1) Scholarships, £125 a year each (tenable for three years):—Robert W. Weekes, electrical engineer; William G. Rennie, engineering student; Thomas G. Jones, engineer; William H. Pretty, mechanical engineer. (2) Exhibitions, £50 a year each (tenable for one year):—Julian J. King-Salter, student; Louis Martineau, engineer; Harold R. Cullen, engineer apprentice; Frederick Hossack, mechanical engineer; William A. Lelean, engineering draughtsman; William F. Nixon, engineer; John Chambers, draughtsman; Joseph W. Kershaw, student; Charles H. Gadsby, engineer's draughtsman; Frederick Charles Lea, apprentice millwright; George Thomas White, mechanic; Joseph H. Gibson, marine engineer; Henry Fowler, engineer apprentice; Arthur E. Malpas, engine fitter apprentice; James Hall, student; Walter E. Lilly, engineer; Charles Jefcoat, Jun., turner; Percy V. Vernon, fitter; George E. Armstrong, engineer student; Martin DeVille, draughtsman; Richard H. Cabena, marine engineer's draughtsman; Frederick Dodridge, engine fitter; Alfred J. Ward, mechanical engineer; William E. Tubbs, coachmaker; Alexander Norwell, mechanical engineer; Richard Baxendale, draughtsman; Walter Amor, fitter; Thomas Bouts, engineer; Alfred Meyer, draughtsman; John W. Anderson, draughtsman.

The list of successful candidates for Royal Exhibitions, National Scholarships, and Free Studentships, 1891, is as follows:—National Scholarship for Biological Subjects—George S. West, student. National Scholarship for Chemistry and Physics—James Bruce, student. National Scholarship for Mechanics—Sydney G. Starling, student. National Scholarships—Charles H. Sidebotham, student; Bernard E. Spencer, student; James H. Smith, pattern maker; John Ball, engineer; Charles Harold Robinson, tobacconist; George W. Fearnley, student; Charles J. Gray, student; Francis Carroll, student; Ralph M. Archer, teacher; Harry Verney, fitter; James Thompson, teacher. Royal Exhibitions—Hubert Cartwright, student; Walter H. Watson, laboratory assistant; Sidney G. Horsley, student; Charlie R. Cross, student; Watson Crossley, cotton weaver; Samuel D. Crothers, farmer; Peter Pinkerton, student. Free Studentships—David Baxandall, student; Herbert C. Robinson, student; William G. Freeman, student; Charles H. Gadsby, engineer's draughtsman; Stephen Pace, none; William H. Dolman, teacher.

SOCIETIES AND ACADEMIES.

Paris.

Academy of Sciences, August 10.—M. Duchartre in the chair.—Artificial production of a micaceous trachyte, by MM. F. Fouqué and Michel Lévy. This trachyte was obtained by the action of water under pressure on a glass resulting from the fusion of Vire granite, and at a bright red heat. The rock was homogeneous, and its sections exhibited beautiful octahedral crystals of a variety of spinel in connection with orthoclase and black mica.—Note on an experiment on ostriculture that has been carried out in the fish-pond of the Roscoff Laboratory, by M. H. de Lacaze-Duthiers.—Physiological research on carbon monoxide in a medium containing it in the proportion of one ten-thousandth, by M. N. Gréhant. After passing a mixture containing a ten-thousandth part of carbon monoxide through blood for half an hour, it was found that the respiratory capacity of the blood was diminished from 23·7 to 23·0 per cent. The difference (0·7) represents the amount of oxygen replaced by carbon monoxide. When the gas was passed through under a pressure of five atmospheres, it was found that the respiratory capacity had diminished from 23·7 to 17·2. This result may be applied to the detection of small quantities of carbon monoxide in confined air, and it also indicates that it is not only the percentage proportion of the gas which must be considered in questions relating to the absorption of it by hæmoglobin, for this remained the same in both experiments, viz. $\frac{1}{10000}$th.—On the refraction and dispersion of crystallized chlorate of soda, by M. Frantz Dussaud. The author has measured with five different instruments the refractive index of chlorate of soda at temperatures between 0° and 30°, and for twelve lines in the spectrum. For the sodium line (D) and a temperature of 20° the value obtained is 1·51510. The result for *a* is 1·50197, and for Cd (18) 1·58500.—On the habits of *Gobius minutus*, by M. Frédéric Guitel.—On the pathological types of the curve of muscular action, by M. Maurice Mendelssohn.—On the preventive inoculations of yellow fever, by M. Domingos Freire. The author has inoculated 10,881 persons with cultures of *Micrococcus amaril*. The mortality of those so vaccinated was 0·4 per cent., although the patients lived in districts infected with yellow fever, whilst the death-rate of the uninoculated during the same period was from 30 to 40 per cent. These results have led the Government of the Brazilian States to found an institute for the culture of the virus of yellow fever and other infectious diseases, and to appoint M. Freire the director.—On a new incandescent light, by M. Bay.

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